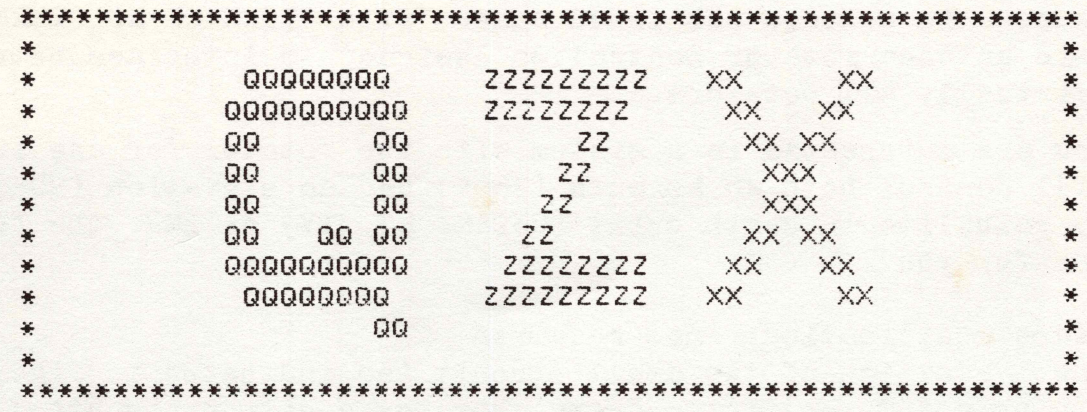
QQQQQQQQ ZZZZZZZZZ XX XX
QQQQQQQQQQ ZZZZZZZZ XX XX
QQ QQ ZZ XX XX
QQ QQ ZZ XXX
QQ QQ ZZ XXX
QQ QQ QQ ZZ XX XX
QQQQQQQQQQ ZZZZZZZZ XX XX
QQQQQQQQ ZZZZZZZZZ XX XX
QQ

The Journal Covering Amateur Radio & Sinclair Computers
ZX-80; Micro-Ace; ZX81; T/S 1000, 1500, & 2068; QL

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Las Cruces, New Mexico
88001

K5XY
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W4GHV
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Editor

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SPACE-1000 ("THE TRACKER")

As you has seen in article published under title "TURN OR NOT TURN?" that is an automatic antenna rotator controller designed to interface between the TS-1000 and virtually all rotators.

Now, if you are interested in a system with two rotator for use in satelli te tracker will control both an azimuth (360°) and an elevation (90°) rotator to follow any satellite in earth orbit (OSCAR, RS, TV) or EME, the following paragraphs are for you.

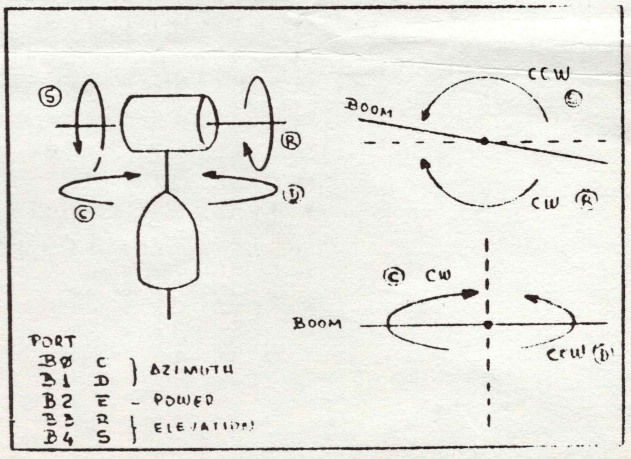
1 - Interface modification: not required
2 - Add-ons: addition of two small circuit (as indicated in fig.3, 4 & 5 of Turn or not Turn?) into control box for additional control of CW and CCW turns in elevation rotator, plus a circuit as Fig. 3.-
3 - Software: some modification for control of both azimuth and elevation rotators.

Step 1 and 2 obviously which should need no comment.

SOFTWARE

The 8255A is a General Purpose Programmable Imput/Output device (PPI), providing three ports which can be used in a number of modes. With our circuits connections, the addresses used being:

ØF	(15d)	PORT A
1F	(31d)	PORT B
2F	(47d)	PORT C
3F	(63d)	CONTROL



Our arrangement with word control "136" make PORT A Output, PORT B Output and PORT C half Output and half Input (PC4 to PC7).

For one system of two rotators you can use the ports configuration shows in Fig 5

By reason of operation, you must activa te simultaneously two ports: one to switch ON power into control box, and other to activate the desired relay (see Fig 2)

The ML of Rotator Control (List 1) allows you to command two rotators with minors changes by means of few BASIC Pokes.

TEST-PROGRAM (Program T2)

```
 1 REM ( ML same of List 1 in Turn or not Turn? article)
10 REM Load desired azimuth beam heading (N= Ø to 255) see foregoings parts
12 POKE 16515,N
14 RAND USR 16514
20 REM Load Elevation data (N= Ø to 127)
22 POKE 16515,N
24 REM Change OUT Ports
```

```
26 POKE 16549,12
28 POKE 16580,20
30 POKE 16521,36
32 RAND USR 16514
```

Lines 20 to 32 allows you to command the elevation rotator, and the first lines controling azimuth rotator. With this small program you can test the satellite tracker system, and can be upgraded conveniently.

Also allows you to add this one as subroutine into a qualified tracking program (see QZX:Vol 2 # 3; Vol 2 # 6; Vol 2 # 10;Vol 3 # 6; and so). If you are interested in developing a fully automatic tracking system, then the ultimate step is the above upgraded program in conjunction with CLK/1000 and by means of convenients PEEKS drived date and time into main program.

BRAKE

If you need to activate brake selenoid of rotator, you can follow same procedure as indicated in lines 24 to 32 of program T2, but adapted to ports B unused (B6 or B7).-

73's LU 8 MAD

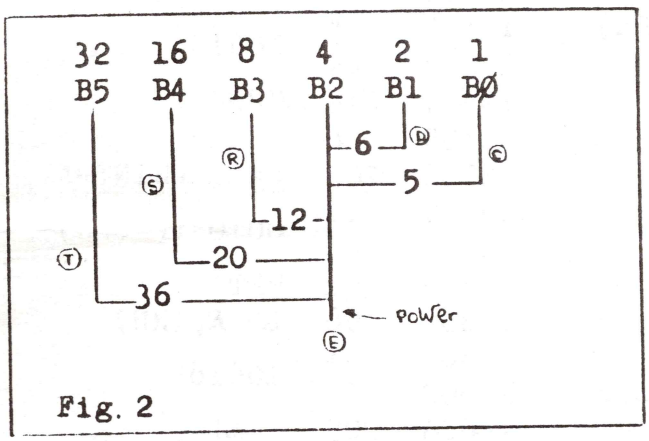


Fig. 2

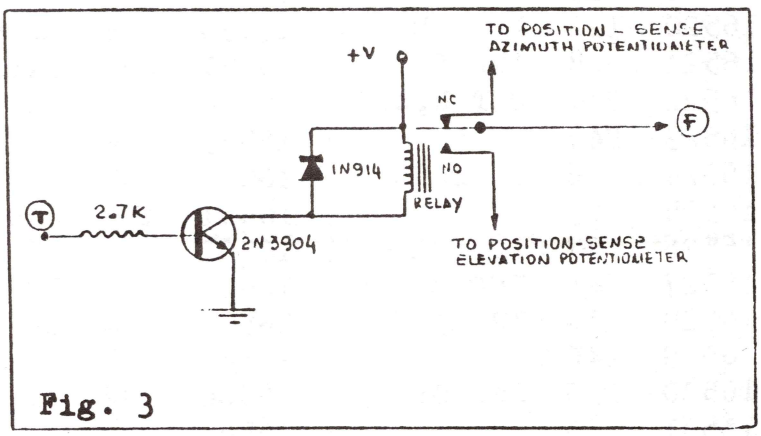


Fig. 3

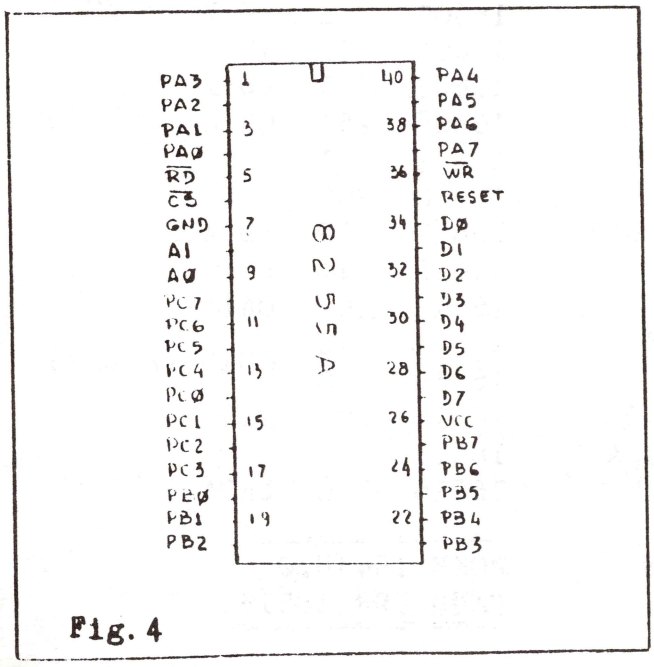

PA3 PA2 PA1 PAØ RD CS GND A1 AØ PC7 PC6 PC5 PC4 PCØ PC1 PC2 PC3 PBØ PB1 PB2
PA4 PA5 PA6 PA7 WR RESET DØ D1 D2 D3 D4 D5 D6 D7 VCC PB7 PB6 PB5 PB4 PB3

Fig. 4

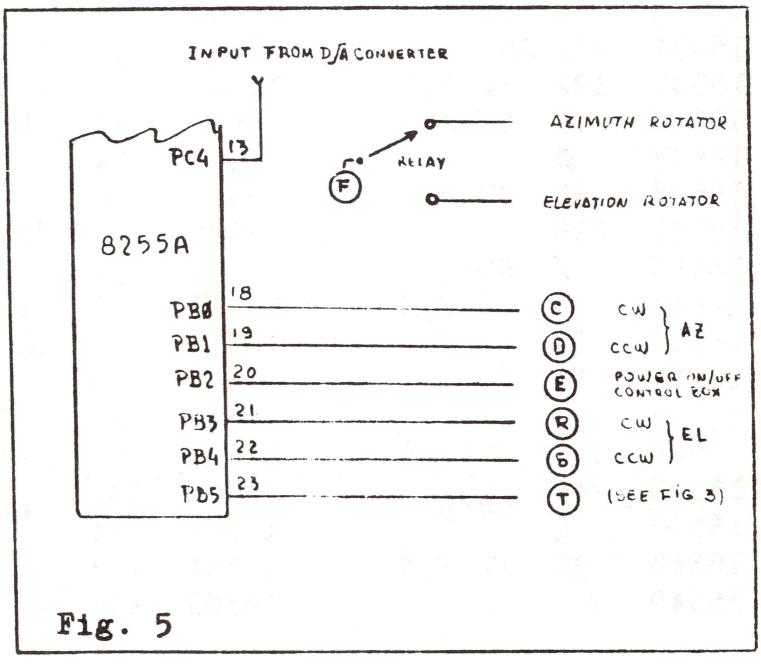


Fig. 5

MLI-CLK/1000

Machine language improvement of program for Clock Calendar interface CLK-1000 (QZX July 1987).(Recovery and display option only, not put into)

The machine language routine in this program provides the speed necessary for no interference with the main program work.

Make use of a ML loader program.
Place holder in 1 REM with at least 106 arbitrary characters.
Enter machine code (decimal) from assembler List 2.

MLI-CLK/1000 - ASSEMBLER (LIST 2)

16514	30	LD E,N	16550	46	LD L,N	16586	240	
16515	0		16551	3		16587	40	JR Z, DIS
16516	46	LD L,N	16552	38	LD H,N	16588	2	
16517	235		16553	2		16589	24	JR DIS
16518	22	LD D,N	16554	82	LD D,N	16590	9	
16519	12		16555	63		16591	58	LD A, (NN)
16520	123	LD A,E	16556	26	LD A,(DE)	16592	234	16618
16521	28	INC E	16557	205	CALL	16593	64	
16522	211	OUT N,A	16558	194	16578	16594	214	SUB N
16523	247		16559	64		16595	8	
16524	6	LD B,N	16560	37	DEC H	16596	205	CALL PRINT-A
16525	63		16561	175	XOR A	16597	16	0010 (P-CHR)
16526	77	LD C,L	16562	29	DEC E	16598	0	
16527	44	INC L	16563	124	LD A,H	16599	201	RET
16528	219	IN A,F6	16564	254	CP N	16600	58	LD A,(NN)
16529	246		16565	0		16601	234	16618
16530	230	AND ØF	16566	32	JP NZ,DIS	16602	64	
16531	15		16567	242		16603	205	CALL
16532	2	LD(BC),A	16568	205	CALL	16604	16	0010 (P-CHR)
16533	21	DEC D	16569	223	16607	16605	0	
16534	175	XOR A	16570	64		16606	201	RET
16535	122	LD A,D	16571	45	DEC L	16607	125	LD A,L
16536	254	CP N	16572	125	LD A,L	16608	254	CP N
16537	Ø		16573	254	CP N	16609	1	
16538	32	JR NZ, DIS	16574	Ø		16610	200	RET Z
16539	236		16575	32	JP NZ,DIS	16611	62	LD A,N
16540	Ø	NOP	16576	231		16612	14	:
16541	6	LD B,N	16577	201	RET	16613	205	CALL
16542	23		16578	6	LD B,N	16614	16	0010 (P-CHR)
16543	14	LD C,N	16579	28		16615	0	
16544	10		16580	128	ADD A,B	16616	201	RET
16545	205	CALL P.AT	16581	50	LD(NN),A	16617	0	
16546	245	08F5	16582	234	16618	16618	0	DATA
16547	8		16583	64				
16548	30	LD E,N	16584	123	LD A,E			
16549	240		16585	254	CP N			

POKE 16418,Ø
RAND USR 16514

This ML work into 1 REM statement.

If you want to put ML into BBRAM, then the following changes of address are necessary, with the ML now into 1 REM ;

```
POKE 16558, 146 }
POKE 16559,  63 } 16274

POKE 16569, 175 }
POKE 16570,  63 } 16303

POKE 16582, 186 }
POKE 16583,  63 } 16314

POKE 16592, 186 }
POKE 16593,  63 } 16314

POKE 16601, 186 }
POKE 16602,  63 } 16314
```

Once you type all above POKE's, you can type the next BASIC program, follow the 1 REM

```
 5 LET C = 16210
10 FOR A = 16514 TO 16618
20 POKE C, (PEEK A)
30 LET C = C + 1
40 NEXT A
```

This DUMPER program copy the ML from 1 REM into BBRAM after address fixed on line 5 (the address can easily be changed)

With a few additional POKES to the program, I will be able to print the time on line 23 of the screen with ML (to make unnecessary POKE 16418,Ø).

```
POKE 16200, 62   LD A,N
POKE 16201,  Ø
POKE 16202, 5Ø   LD(NN),A
POKE 16203, 34   (16418)

POKE 16204, 64
POKE 16205, 195  JP NN
POKE 16206,  82 }
POKE 16207,  63 } 16210
```

If you want another print position for the retrieve time, you must change some statements in the program.

In assembler List 2 (before dump) change byte of address 16542 (Line of screen) with desired number of line (Ø to 23). Also change byte of address 16544 (column of screen) with desired column number.

Now, If you want to add time display into any program, the only instruction necessary is RAND USR 16200 (with number of line) and you can see the time rapidly, at speed of machine language(Don't forget to put ML-CLK/1000 into BBRAM..!).

Also if you type into main program conventional PEEK's into address 16363 to 16375 (see page 7 of QZX July 1987), you can set date and time values exactly if POKE 16236, 2Ø1 and RAND USR 1621Ø is prior to the PEEK's, but time is not displayed for ML at line 23.

SUMMARILY

If ML resided in 1 REM	POKE 16418,Ø RAND USR 16514	Print At 23,10; HH:MM:SS (only)
If ML resided into BBRAM	RAND USR 16200	" " " "
For another use of information (not displayed)	POKE 16236,201 RAND USR 16210	PEEK's 16363 to 16375 (Date & time)

73's from LU8MAD, Guillermo

Note to MLI-CLK/1000
This program reads the register contents only. For loading the register (for the first time) use Line 1 to line 190 (less line 5) and line 9000 to line 9050 of BASIC program in QZX July 1987, page 6.

****

A SATELLITE STATION by KIT KOHLMOOS, W6ISO

A few years ago I had trouble understanding why hams were putting computers in their shacks. The darn things made a lot of noise and as far as I could see didn't have a thing to do with radio communications. Then an article in ORBIT magazine offered to help me plot satellite orbits and with the promise of a very useful bird about to be launched, phase 3B, I thought I'd better see if there was really something that a computer could be used for. The TS1000 was making a big splash at the time and AMSAT was offering software for it that would tell me where and when I should expect to be able to hook up with DX via satellite.

Software has come a long way since then. Color screens with blips trotting across to show the ground track, interface with antenna azmuth and elevation controls so that your hands are free to run the rig, pages of predictions for any bird for years in advance if you need them and I think some has an AFC hookup so you never have to tune the receiver any more. I wouldn't say that was better than girls - but...

The station at W6ISO consists of a TS1500 for orbit predictions with the original AMSAT software. It works just great. An upgrade to some "off brand" computer would help if I had one of those modern AZ/EL motors and interface. On 2 meters an IC251A is hooked up to a KLM 143-150-14C crossed Yagi thru 40 feet of RG 213/U cable. A gasfet preamp is mast mounted. An antenna with 2 to 3 db more gain would be a big help since the present set-up is a little lacking some times.

On 70 cm we have a Microwave Modules transverter driven by an IC720A into a KLM 420-450-18C crossed Yagi. The feed line is 40 feet of Belden 9913 cable. The 10 watts out from the transverter is sometimes marginal because many operators don't know how to fine tune a receiving system. The flexibility of the IC720A makes it a superb IF for the transverter.

Some good QSO's have been made in spite of the spartan equipment. We have the Philippines, Greece, VK, ZL, JA, some west Europeans and the US logged so far. Planned improvements will start with some new antennas. Also, the new phase 3C will have 23 cm and 13 cm capability so we have to work out the means for using those links. With the recent Ariane launch success phase 3C is scheduled for a January '88 ride on V22. Not much time to get ready.

AO-10 is suffering from radiation sickness and the control stations are not able to keep the solar panels aligned with the sun. It therefore has some extended eclipses during which we do not use it. But when the batteries are charged it is still an excellent relay. There are a few power hogs that work it from time to time. They find that few stations will work them because the word gets around. Use of excessive power swamps the AGC line and cuts output way down. So, please keep your EIRP down to 100 to 200 watts. The way to make it is with a good receiving system. A 12 to 15 db antenna and a good gasfet with 1.0 db noise figure or better mounted at the antenna will do it.

If you're curouis about what's going on listen to, or better yet, check into the AMSAT net on 3.840 mc, Tuesdays at 8:00 local time. Page 66 of the November '87 QST has the latest info on the Russian satellites. They have up and down links on 15, 10 and 2 meters.

AMSAT will send you a list of software available but before you order check into one of the nets and ask which ones are popular. Amsat is at P.O. Box 27, Washington, D.C. 20044. Phone 301-589-6062. Membership is $24 a year. See you on the bird. - 73, W6ISO -

References for A Satellite Station

Helical antenna design program
QZX 1985 February page 4
Kraig Pritts KA2LHO
use at least 10 turns.

The Experimenters Handbook
by Martin Davidoff (ARRL)

Amateur Satellite Report
comes with AMSAT membership

VHF/UHF Manual
by G. R. Jessop (RSGB)

DL6WU Antenna Designs
They work!

Publisher's Notes
K5XY

I received an interesting Macintosh disk from Anthony J. Oresteen, 452 Orion Rd., Batavia, IL 60510. On it was some software which included a program to convert Sinclair ZX 81 BASIC files (tokens) to ASCII files. He used ZBasic on the Mac to recompile his old but still usefull ZX 81 programs on the Mac. He has ported about 25 BASIC programs in this way. His method requires a RS 232 port on the ZX 81 (see the article by LU8MAD in back issues). He will send a copy of this Macintosh disk to anyone who sends him a disk, SASE, and a $5 donation. Ask him for his long list of ZX 81 stuff for sale too.

QZX costs are going up. The cost of printing just went up 15%. Postage is due to go up and if we do not get more subscribers soon we will probably have to go to first class postage which will about double our postage bill. I suspect that we will have to increase the subscription rate in the near future.

The big push at the end of the year is to catch up the publication date of QZX to the month of publication. A schedule which appears to be realistic has been set up. The May issue should be received at the beginning of May.

UNCLASSIFIED ADS

WANTED: UNCLASSIFIED ADS for publication in QZX. Cost is 1 cent for each keystroke (characters, blanks, etc.). Payment must be included with order. This is an excellent way to sell your program or unwanted equipment, ask for help, or find a specific program. Send your ad with payment to QZX, 2025 O'Donnell, Las Cruces, NM 88001.

WANTED: Documentation or schematic for "Compusa" FDC-100 Controller. Edward L Radtke, WA4BQE, 1602 Woodluck Ave., Louisville, KY 40205. 1-502-458-7324

FOR SALE: Index to QZX consisting of a bound book of xerox copies of all the covers since December 1982. Send $5.00 plus $1.00 shipping and handling ($2.00 if to a non-US address) to QZX, 2025 O'Donnell, Las Cruces, NM 88001.

FOR SALE: ZX Spectrum computer 48 K color & sound with 60 Hz 120 V supply. Computer output on ch. 33 UHF TV band. Complete package w/ prints and manuals, some software. $75.00 mint cond. James Zilvilis WA1JBS, 46 Hart St., Watertown, Conn 06795.

WANTED: I would like to receive correspondence from Sinclair 1000 owners who have had experience with Eckhardt's "COMLINK I" device and Micrologs "SWL" device. Gerald C. Stillman, 128 Highland Ave., Salem, MA 01970.

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BITS AND BYTES

101 On the T/S 2068 the space and the break key are in parallel. There is no difference between them. That means that the break key can operate as the space key and that a SHIFT SPACE will break into your program just the same as the SHIFT BREAK will.

102 A bug in the ROM of the T/S 2068 causes problems when the DELETE (Cap Shift 0) is held down to delete multiple characters in the edit line. Sometimes it outputs the DELETE keyword instead of just deleting characters as it should in the auto-repeat mode. This oddity is especially noticeable when the edit line is long. The cure is to try releasing and pressing the DELETE key at differing frequencies.

103 On the QL the vertical (up and down) line | (shifted reverse slash, top right key), when typed twice will replace "OR" in a program statement.

104 For those of you who have come to the QL from the T/S 2068, there are some differences between the two BASICs. When combining two strings on the T/S 2068, you use "LET A$ = B$ + C$". On the QL, however, the same statement must read "LET A$ = B$ & C$". That is, you must use a & not a +.

105 To initialize a T/S 1000 without pulling the plug, enter RAND USR 0.

106 To adjust the tape recorder volume when loading, simply stop the tape recorder a few seconds after you have begun to load a tape. The computer will either crash, which means the program was loading correctly, and that the volume was ok; or it will continue in a search patten which means there was a problem with either the title of the program or the volume of the tape recorder.

107 Different ways of expressing the same number in Sinclair BASIC can take up widely differing amounts of memory. For example VAL "4E4" uses 8 bytes, 4E4 uses 9 bytes, VAL "40000" uses 10 bytes, and 40000 uses 11 bytes.

108 To get the QL to accept both uper and lower case into a string use a double equal sign. For example if you want to accept both y and Y use

```
IF q$ == "y"
```

DISK QUALITY
K5XY

Here is a summary of an article which appeared in the November 1987 issue of Software News. It will be of particular interest to those readers who have added disk drives to their Sinclair computers.

Memory Control Technology Corp. has recently issued a report on the results of tests run on large numbers of disks, with average prices ranging from $1.62 to $0.50, bought from a variety of companies.

The main conclusion was that "no relationship exists between the price and quality of 5 1/4 floppy disk media."

Groups of 100 disks were tested. Visual and ANSI tests were performed. Only three of the 18 brands, BASF, JVC, and Memorex, had all disketts meet ANSI requirements in both the missing bit and extra bit magnetic property tests.

Visual testing found 125 defects in the 100 3M diskettes, 14 for the Syncom disks, and 12 in both the Dysan and Verbatim products. No more than four defects were found in the remaining brands.

"Disk makers whose wares were found wanting, including Xidex/Dysan, 3M, and Verbaim, discredited the study, while vendors such as BASF, whose products were found to be of top quality, said the results were unsurprising."

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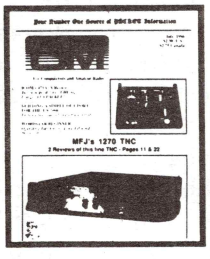

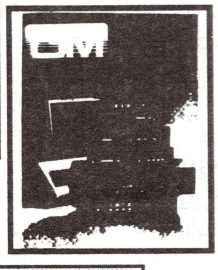

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Types of Sinclairs Owned
K5XY

Have you ever wondered what kind of Sinclair computers you fellow club members owned. Of course Bo and I have, because we want to publish information of interest to most of our readers. Unfortunately we do not have the information on the type of Sinclair computers owned by our members. However I was able to analyse the types owned by a large midwestern Sinclair computer club.

The types of computers were divided into the ZX 81 type which included the T/S 1000, the T/S 1500 type because it has a non-membrane type keyboard, the T/S 2068 type which includes the Spectrum, and the QL type. Some members did not list their computer and a large number owned more than one type. The results are given in the table below.

Type of Computer	Percentage of Members owning
ZX 81	38
T/S 1500	8
T/S 2068	76
QL	22
not given	11
more than 1	54

FIELD DAY LOG ADDITIONS
Ferdinand Gunther, K7FG

Here are spme comments on the Field Day Log and Dupe program which KQ2F wrote for the September 1987 issue of QZX.

Use an appropriate name for the saved program in line 9000, like "FD1 6/87", and save at intervals. The saved program will self-start when loaded with this name. Initially the program, which I call "FD LOG", must be started manually with RUN ENTER when using the T/S 1000.

Portable stations like K7FG/9 must be entered as K97FG to get the correct area 9 total.

Adding the following lines will prevent the third time digit from exceeding 5.

```
4442 LET B = CODE T$(3)
4444 IF B > ## THEN GOTO 4410
```

An incorrect time entry of 12345 is posted as 1234. Line 4412 does not work for either of my T/S 1000's.

Line 7910 needs a semicolon and quote mark.

BOOK REVIEW
K5XY

The Basic Guide to VHF/UHF Ham Radio, by Edward M. Noll, W3FQJ. Tiare Publications. ISBN: 0-936653-11-6. 5 1/2 x 8 1/2 86p. $6.95 plus $1 shipping from Tiare Publications, Box 493, Lake Geneva, WI 53147.

Written by well known ham radio and technical writer Edward M. Noll (W3FQJ), this new volume provides a down-to-earth basic introduction to amateur radio operating on the 2, 6, and 1.25 meter bands as well as 23, 33, and 70 cm.

The book presents a clear and easily understood look at VHF/UHF equipment, antennas, operationg trechniques, repeaters, contesting, and awards. Band plans for each of the VHF/UHF bands are also included.

The book is obviously written for beginners and goes into few details. I was disappointed that no mention at all was made of packet, satellite communications, fax, or any other computer related modes. The book is small but so is the price. It is well produced, easy to read, and has reasonable illustrations.

QZX FRIENDS

W*0QND -- Mark is about to get his novice license and will then be on the air with his ZX 81, 64K RAM, and Byteback modem.

73, W4GHV & K5XY

QZX presents the best software & hardware projects available for the radio amateur. While the contents are believed to be accurate, no warranty is extended on any program or project. No investigation has been made of the claims or reputation of any advertiser. It would be greatly appreciated if all correspondence requiring an answer would be accompanied by a self-addressed stamped envelope (SASE). Copyright by QZX, 1987. All righs reserved, photocopying by permission only.

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